Technical Note: Auto Voice VLAN Detection and Configuration

SMB Business Ethernet Switch 50

Version:	NN70000-002 issue 1.00
Date:	July 08th 2008
Status:	Released

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Revision History

Revision (Ver.Iss)	Issue Date	Document Status	Change Description
0.01	2008-07-08	Released	First external release version.

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About this Document

This document is intended for people responsible for deployment and support of the Nortel Business Ethernet Switch 50. This may include:

- Customer System Engineering
- Channel Partner Engineering
- Nortel Solutions Engineering
- Knowledge Systems / Education Services

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Introduction

This application note describes the procedure to enable and configure the "Auto Voice VLAN Detection and Configuration" feature on the BES50 switches. With this feature when connecting the BES50 to a compatible Nortel IP phone, the BES50 switch automatically detects the presence of the IP phone and assigns the appropriate VLAN membership to its Ethernet port. This is achieved by the Link Layer Discovery Protocol message exchange between the BES50 switch and the IP phone. The IP phone learns the voice VLAN membership information carried in the LLDP messages, and configures its Ethernet port accordingly. The BES50 switch expects Ethernet frames originated from the IP phone are tagged with the appropriate VLAN ID, and it also tags all outgoing frames towards the IP phone with the same voice VLAN ID.

Software/Firmware Lineup

The "Auto Voice VLAN Detection and Configuration" feature on the BES50 switches is designed to work with designated Nortel IP phone. Please check software or firmware version of the Nortel IP phone and the BES50 switches to ensure this feature is supported. The following BES50 switches and Nortel IP phones were tested in this application note:

Device	Model	Firmware/Software
BES50 FE	BES50FE-24T PWR	1.0.3.0
BES50 GE	BES50GE-24T PWR	1.0.5.0
IP Phone 2001	NTDU90	0604DBG
IP Phone 2002	NTDU91	0604DAD
IP Phone 2004	NTDU92	0604DBG
IP Phone 1120E	NTYS03	0624C4N
IP Phone 1140E	NTYS05	0625C4D
IP Phone 1220	NTYS19	062AC57
IP Phone 1230	NTYS20	062AC57

Please ensure the BES50 switches are using at least the software version specified in this application note (or later software version). Consult the document "Using the Nortel Business Ethernet Switch 50 Series" (NN47924-301) for the detailed software upgrade procedures.

Step 1: Create a VLAN with the name "voice"

- From the WebUI, navigate to the Applications > VLAN > 802.1Q VLAN > Static List panel.
- Create a new VLAN with the name "voice" (NOTE: all lower case without the quote) and select an unused VLAN ID between 0-4094.
- Select and press the **Submit** button.

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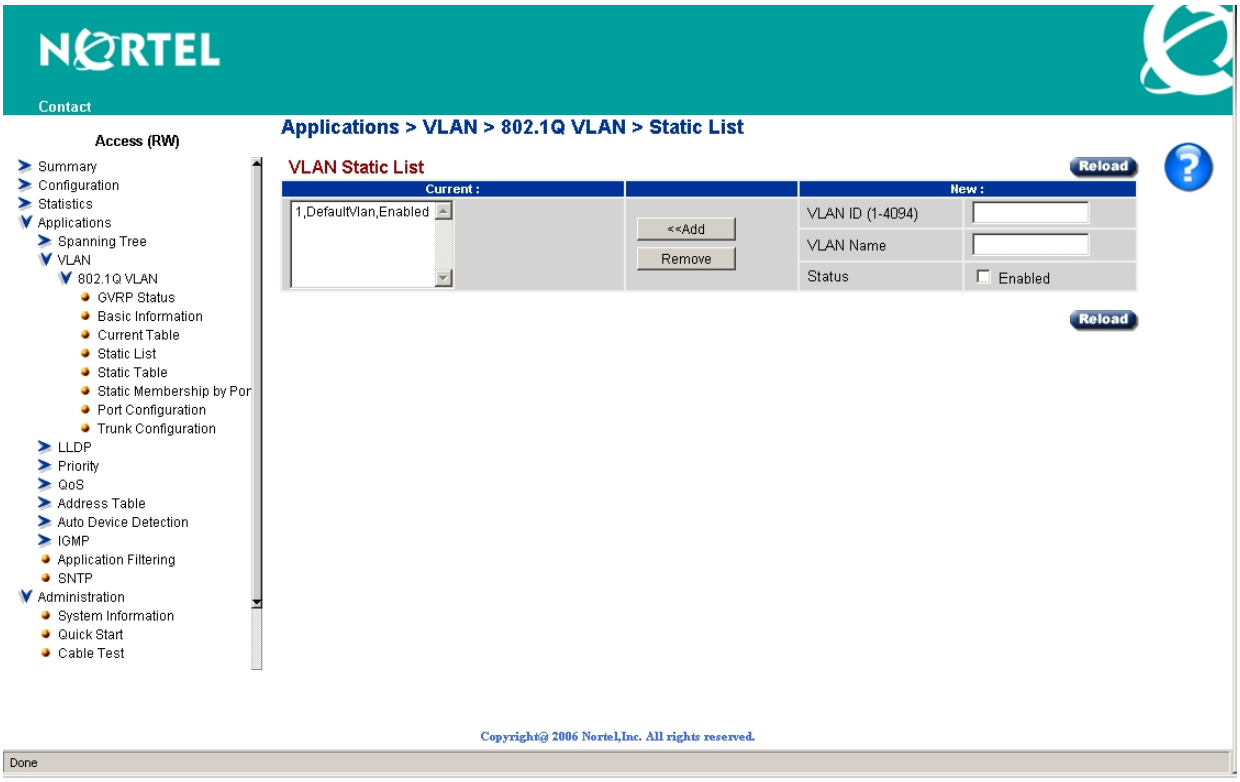
NORTEL
Contact
Access (RW)
Summary
Configuration
Statistics
Applications
Spanning Tree
VLAN
802.1Q VLAN
GVRP Status
Basic Information
Current Table
Static List
Static Table
Static Membership by Por
Port Configuration
Trunk Configuration
LLDP
Priority
QoS
Address Table
Auto Device Detection
IGMP
Application Filtering
SNTP
Administration
System Information
Quick Start
Cable Test
Applications > VLAN > 802.1Q VLAN > Static List
VLAN Static List
Reload
Current :
1,DefaultVlan,Enabled
<<Add
Remove
New :
VLAN ID (1-4094)
VLAN Name
Status
Enabled
Reload
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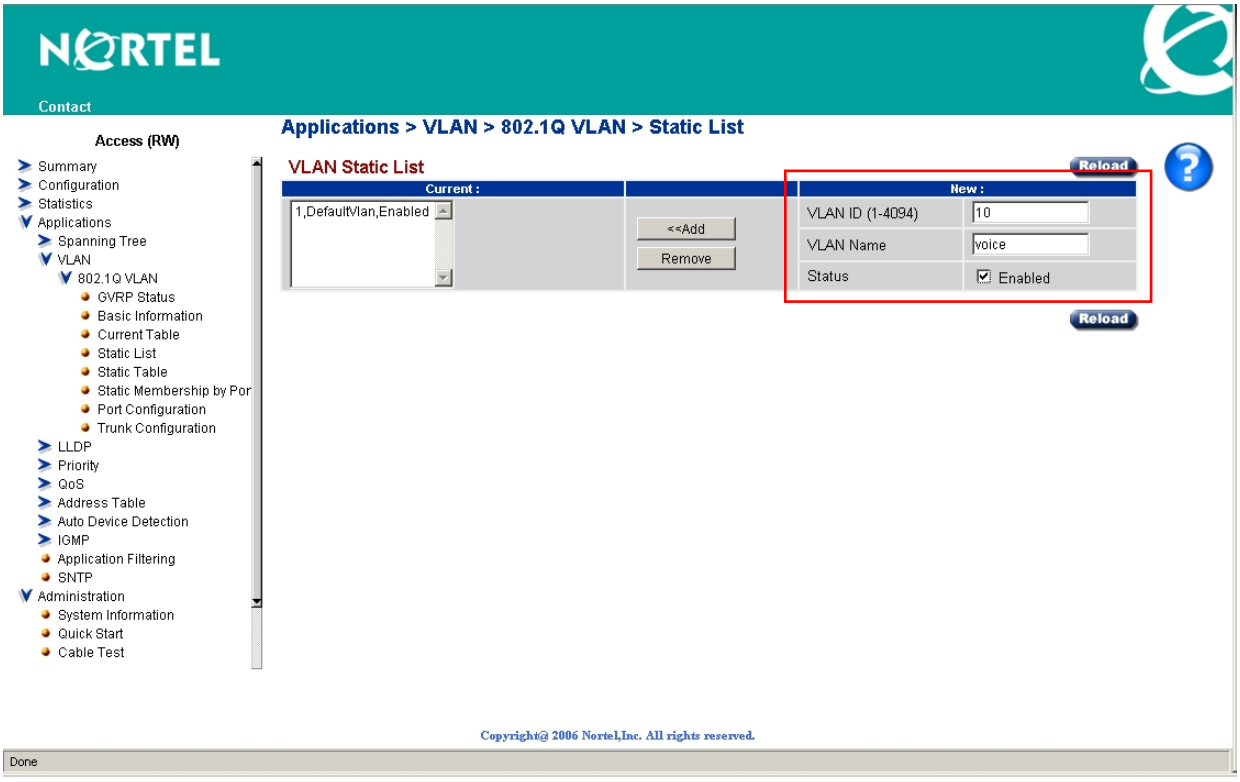
Done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Static Table
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Application Filtering
SNTP
Administration
System Information
Quick Start
Cable Test
Applications > VLAN > 802.1Q VLAN > Static List
VLAN Static List
Reload
Current :
1,DefaultVlan,Enabled
<<Add
Remove
New :
VLAN ID (1-4094)
10
VLAN Name
voice
Status
Enabled
Reload
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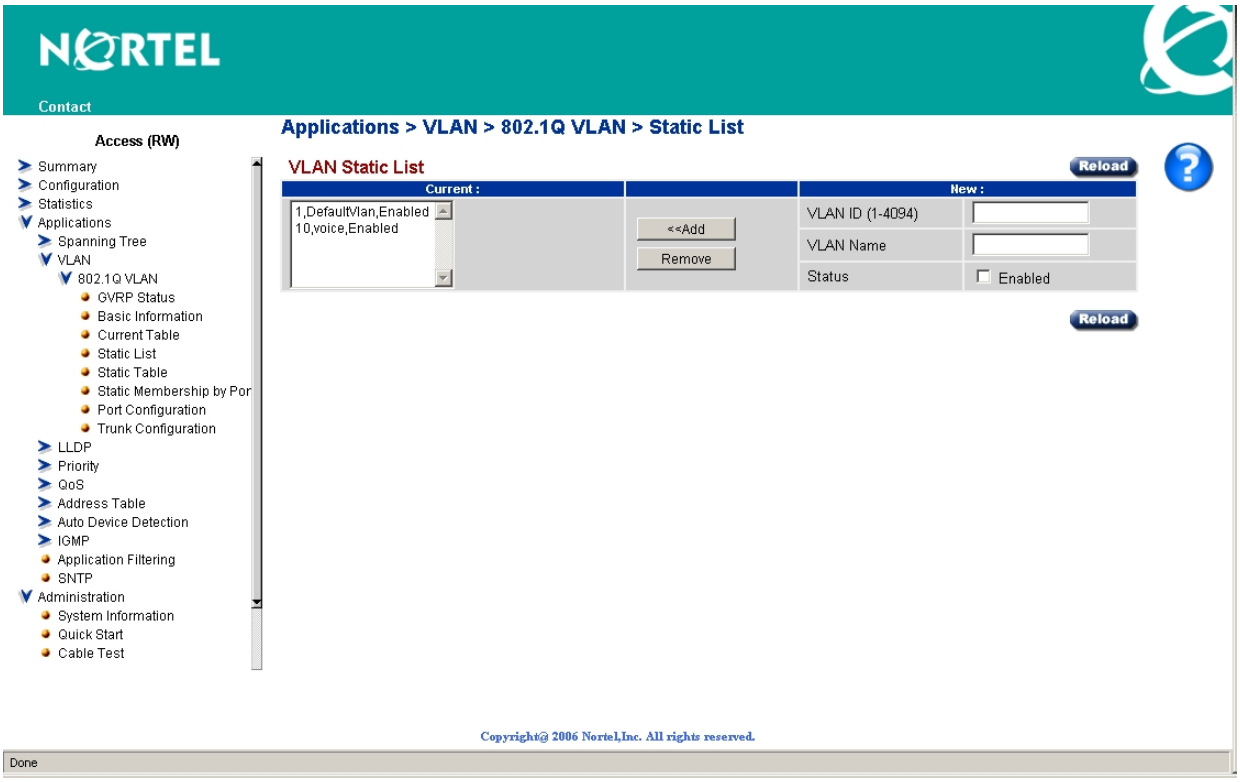
Done



Step 2: Enable Link Layer Discovery Protocol (LLDP)

The Auto Voice VLAN detection feature uses LLDP for the IP phone and the BES50 to discover each other, and to exchange voice VLAN information.

- From the WebUI, navigate to the Applications > LLDP > Configuration panel.
- Selected the checkbox labeled **Enabled**.
- Select and press the **Submit** button.

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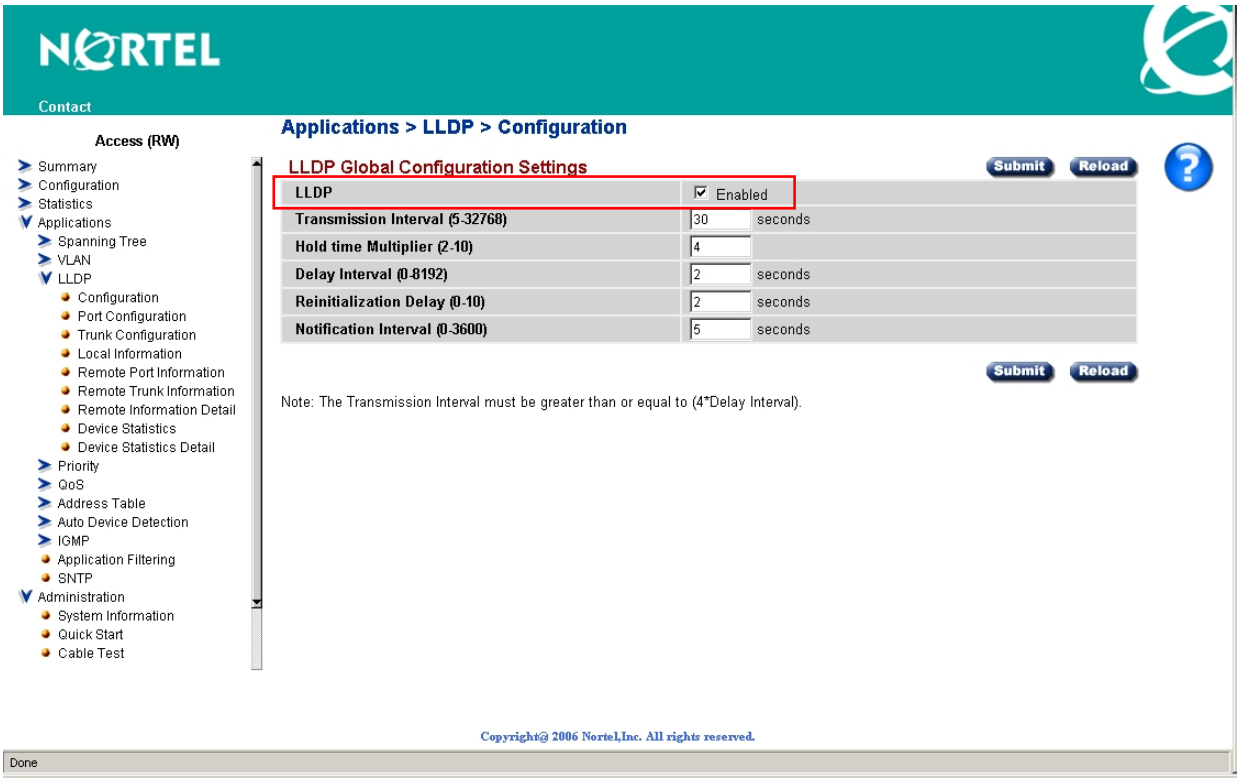

Step 3: Enable Global Voice VLAN Detection

In order to use the auto voice VLAN detection, this feature must first be enabled on a global basis.

- From the WebUI, navigate to the Applications > Auto Device Detection > Voice VLAN > Global Settings panel.
- Selected the checkbox labeled **Auto Detection Status**.
- Fill the **Voice VLAN ID** created in Step 1 (in our previous example VLAN ID 10)
- Select and press the **Submit** button.

While this configuration step is identical for both BES50FE and BES50GE switches, the WebUI panels of these two switches are slightly different.

The following screenshot illustrates the BES50GE WebUI panel.

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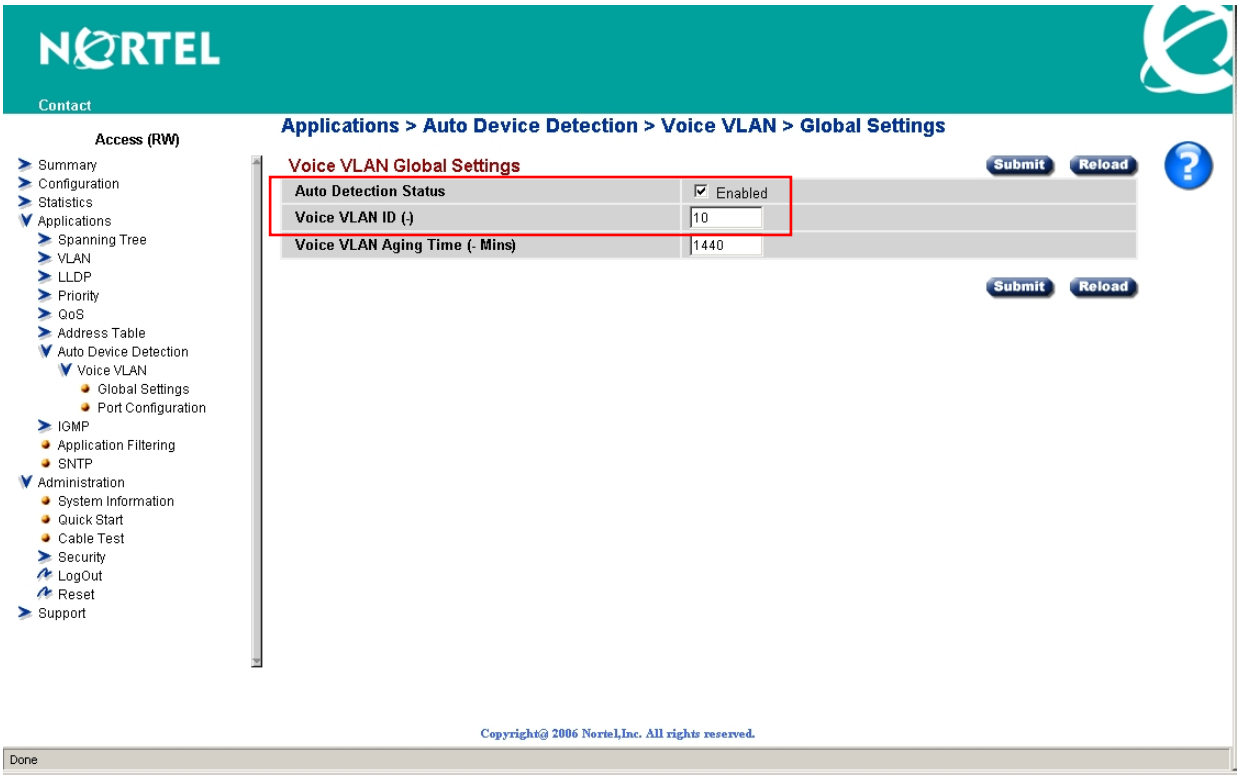
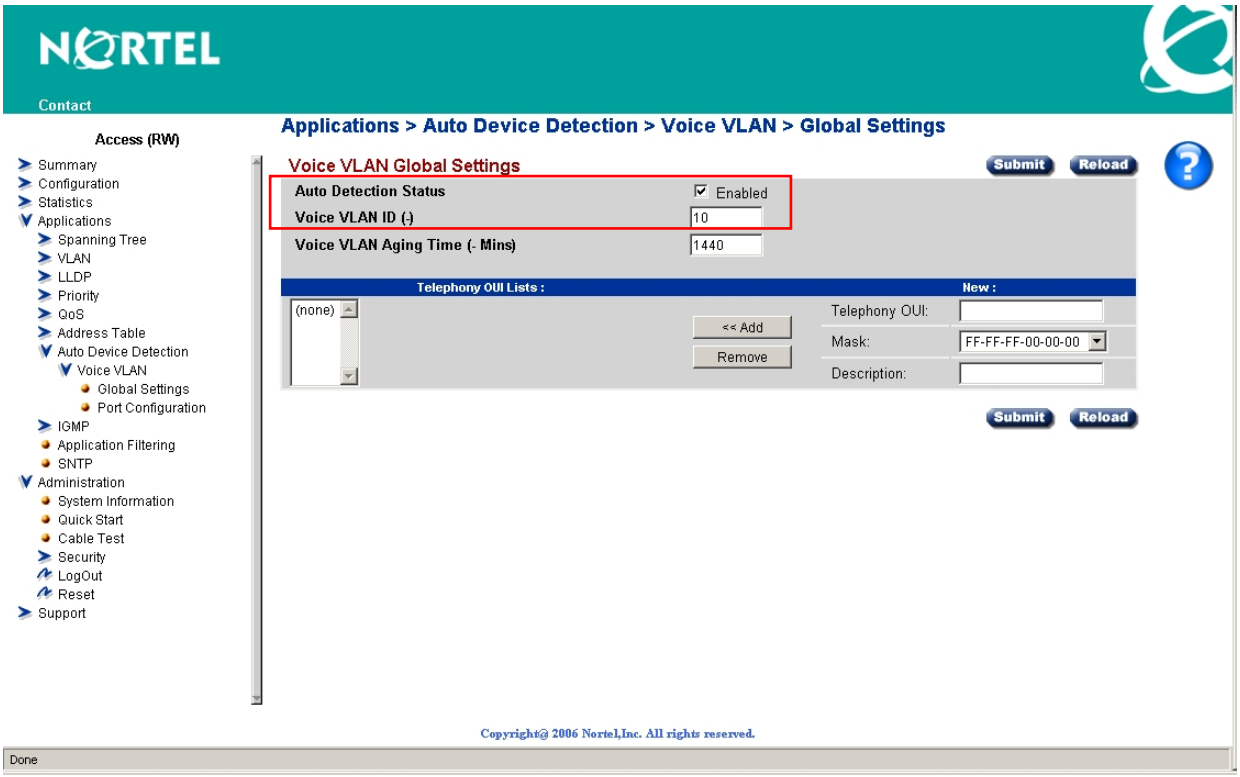


The following screenshot illustrates the BES50FE WebUI panel.

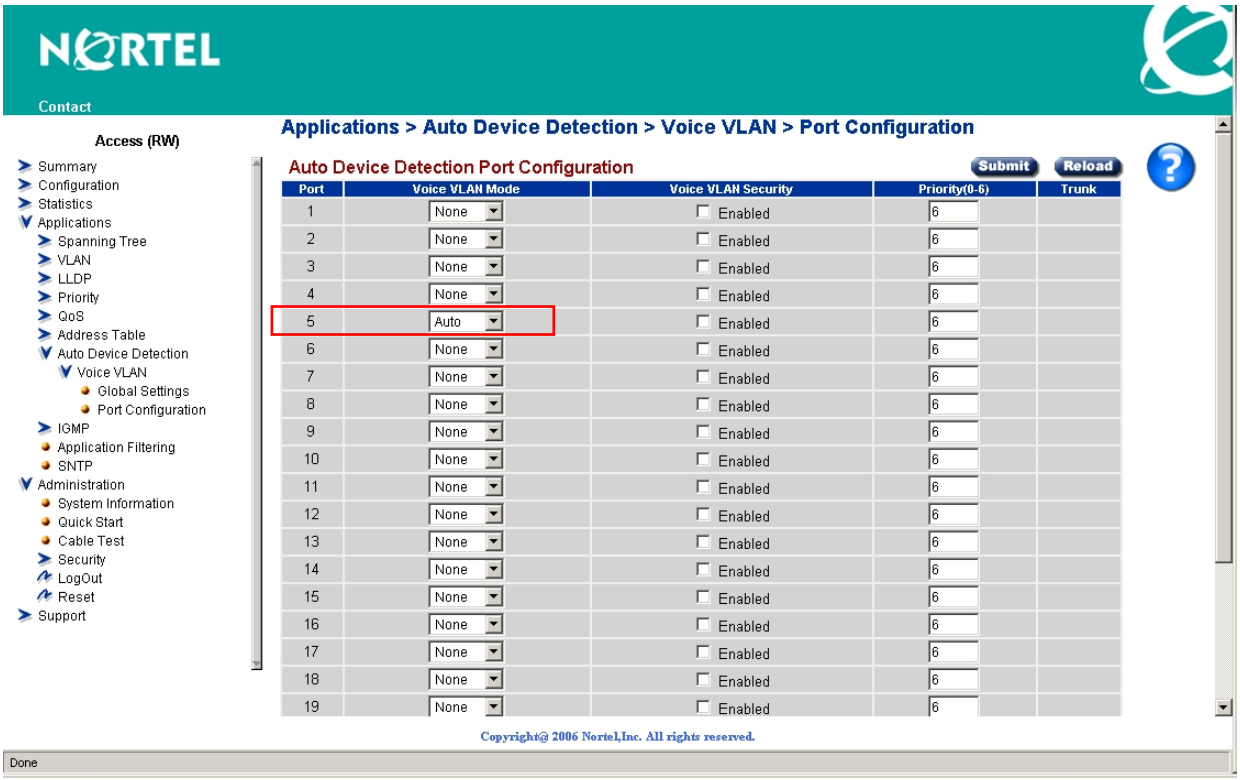


Step 4: Enable Per-Port Voice VLAN Detection

The final configuration step is to enable voice VLAN detection on the ports in which IP phones may connect to. While both the BES50FE and BES50GE switch need to enable the same “Voice VLAN Mode” attribute, the WebUI panels of these two switches are slightly different.

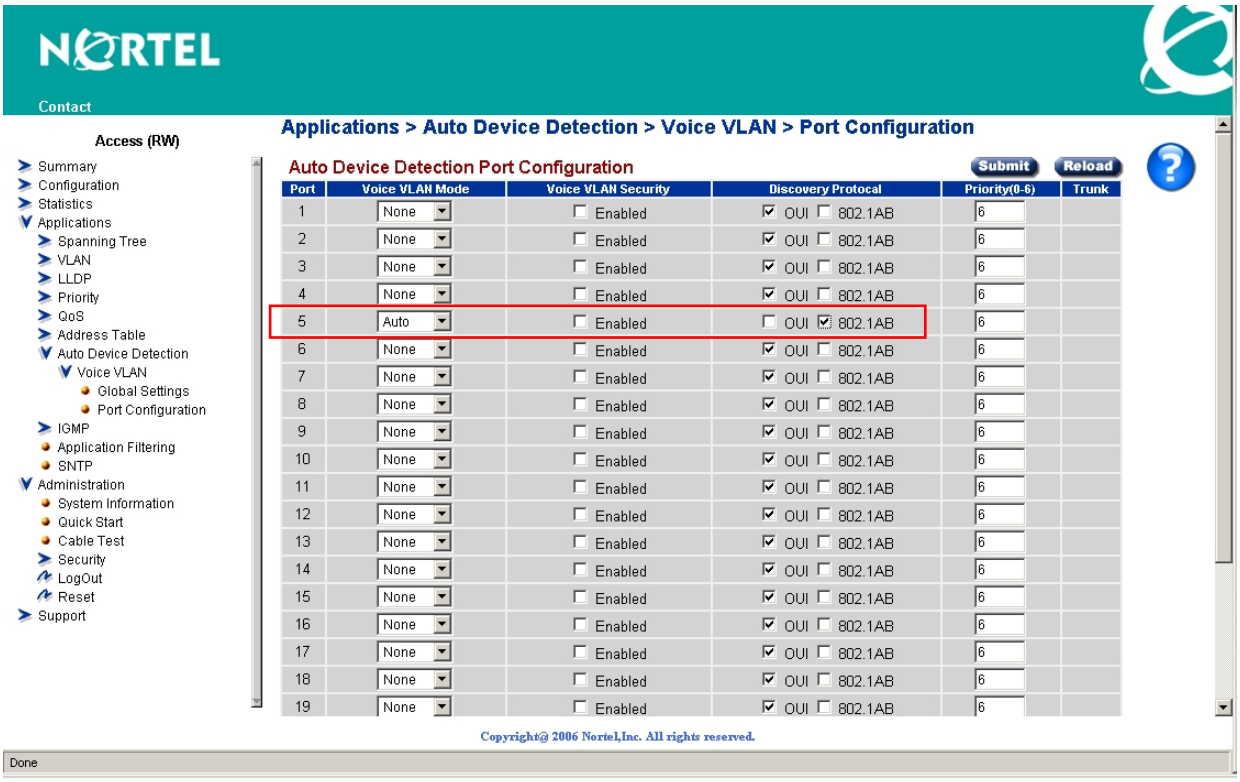
The following screenshot illustrates the configuration procedure for BES50GE.

- From the WebUI, navigate to the Applications > Auto Device Detection > Voice VLAN > Port Configuration panel.
- Move to the row corresponding to the target Ethernet port. E.g. for port 5, move to the row labeled “5”.
- From the pull down menu of the **Voice VLAN Mode**, select **Auto** mode.
- Select and press the **Submit** button.



The following screenshot illustrates the configuration procedure for BES50FE.

- From the WebUI, navigate to the Applications > Auto Device Detection > Voice VLAN > Port Configuration panel.
- Move to the row corresponding to the target Ethernet port. E.g. for port 5, move to the row labeled “5”.
- From the pull down menu of the **Voice VLAN Mode**, select **Auto** mode.
- Under the **Discovery Protocol** attribute, select the checkbox labeled **802.1AB**.
- Select and press the **Submit** button.



Step 5: Connect IP Phone to BES50

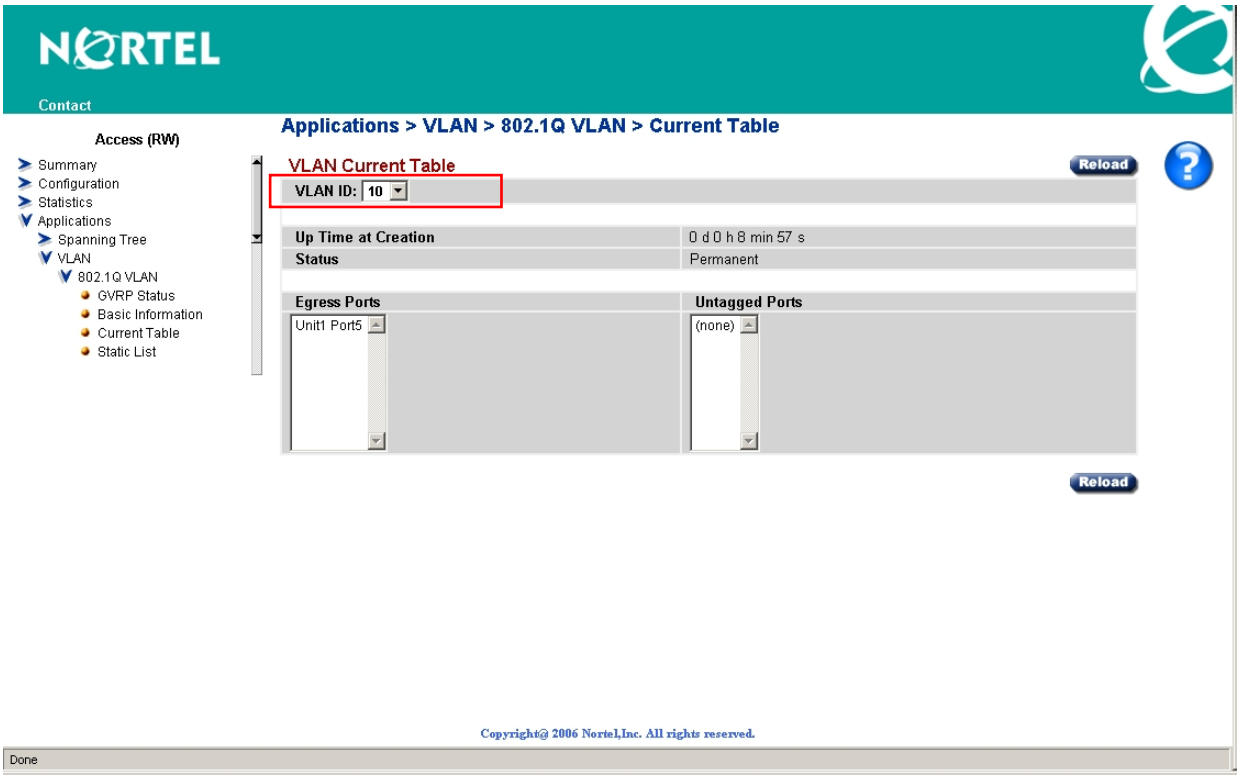
Connect a compatible Nortel IP phone to the port with auto voice VLAN detection enabled (e.g. port 5 in the previous example).

Step 6: Check Auto Voice VLAN Detection Status

After the IP phone is connected, wait for the IP phone and the BES50 switch discover each other. The following simple steps can be used to check whether the Voice VLAN is automatically configured when the IP phone is connected.

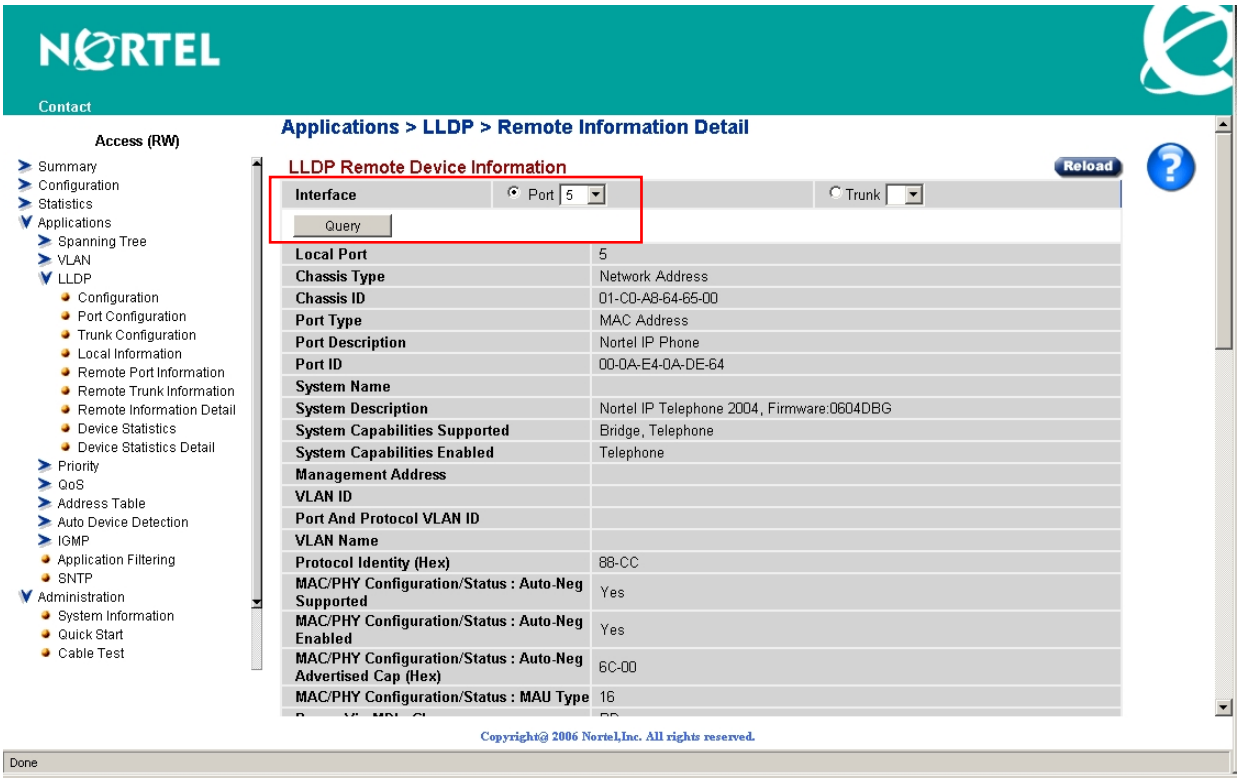
VLAN Membership

- From the WebUI, navigate to the Applications > VLAN > 802.1Q VLAN Current Table panel.
- From the pull down menu, select the voice VLAN ID (in our previous example the VLAN ID is 10)
- Check and ensure that the port in which the IP phone is connected to (in our previous example port 5) is included in the **Egress Ports** list but not included in **the Untagged Ports** list.



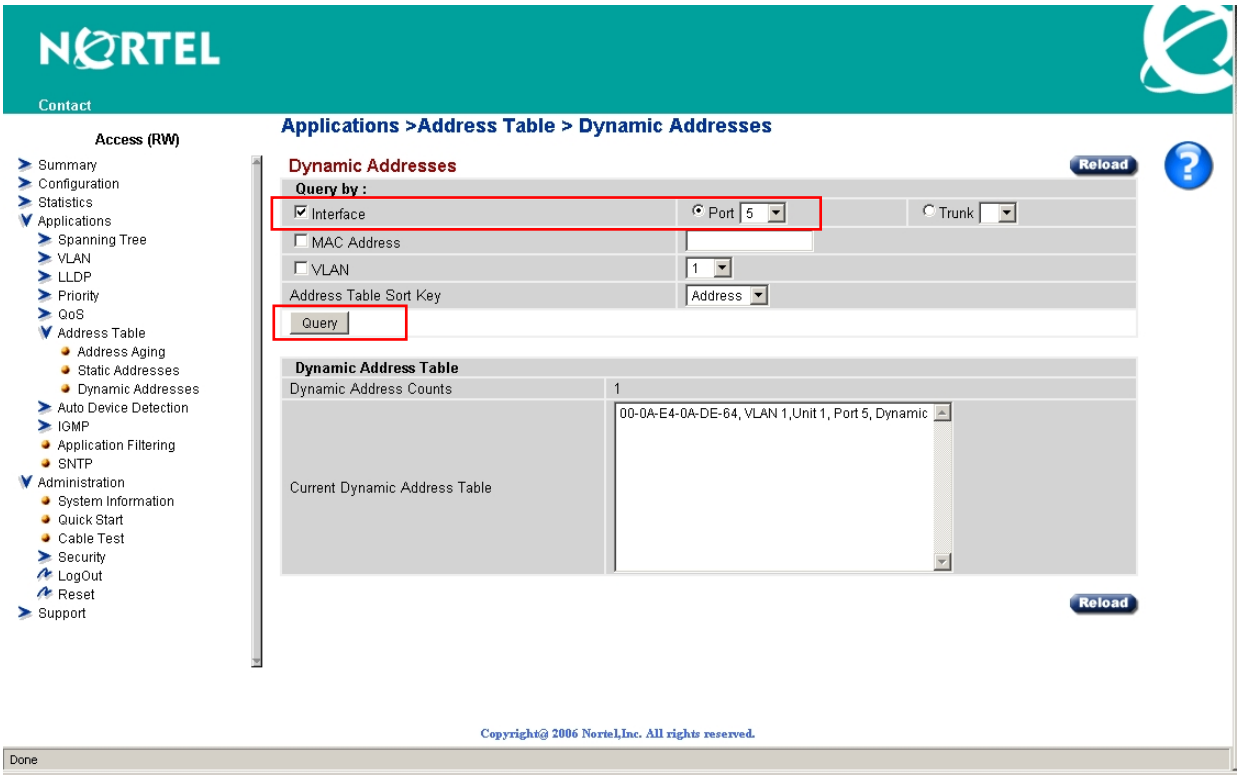
IP phone LLDP information

- From the WebUI, navigate to the Applications > LLDP > Remote Information Detail panel.
- From the pull down menu, select the port in which the IP phone is connected to (in our previous example port 5).
- Select and press the **Query** button.
- Check and ensure that device is discovered as Nortel IP phone and the phone firmware version is correct.



IP phone MAC address

- From the WebUI, navigate to the Applications > Address Table > Dynamic Addresses panel.
- Select the **Interface** checkbox and click on the radio box labeled **Port**.
- From the interface port pull down menu, select the port in which the IP phone is connected to (in our previous example port 5).
- Select and press the **Query** button.
- Check and ensure that MAC address of the Nortel IP phone is discovered and associated with the correct Ethernet port (in our previous example port 5).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Application Filtering
SNTP
Administration
System Information
Quick Start
Cable Test
Security
LogOut
Reset
Support
Applications >Address Table > Dynamic Addresses
Dynamic Addresses
Reload
Query by :
Interface
Port 5
Trunk
MAC Address
VLAN
1
Address Table Sort Key
Address
Query
Dynamic Address Table
Dynamic Address Counts
1
Current Dynamic Address Table
00-0A-E4-0A-DE-64, VLAN 1,Unit 1, Port 5, Dynamic
Reload
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Done

Appendix A: Nortel IP Phone Configuration

The "Auto Voice VLAN Detection and Configuration" feature on the BES50 switches is designed to work with designated Nortel IP phone. The IP phone must support Link Layer Discovery Protocol (LLDP), able to learn voice VLAN membership information carried in the LLDP messages, and have the capability to configure its Ethernet port according to the received VLAN information.[1]

This appendix provides examples of how to configure specific models of Nortel IP phone to take advantage of the BES50 "Auto Voice VLAN Detection and Configuration" feature. Please refer to the respective user manual of relevant Nortel IP phone for more detailed configuration information.

NORTEL IP Phone 1220/1230

1. Power cycle the IP phone.
2. Wait until you hear the power on music tone.
3. When you see the Nortel name/label, press the four function keys under the display individually in order from left to right.
4. The first password is 2264.
5. Select 3. Network Configuration
6. The second password is 26567*738
7. Configure the phone attributes as indicated below
   - Press "OK" to navigate to the next attribute.
   - Press "backspace" to change a setting.

EAP Enable	N
LLDP Enable	Y
DHCP	Y
DHCP	Full
Speed	A
Cfg XAS	N
Voice 802.1Q	Y
VOICE VLAN	Y
VLAN Cfg	Auto
LLDP Med	N
LLDP VLAN	Y
DHCP	Y
VLAN Filter	N
Media Bits	8

8. Leave data port settings at default. (enabled, no data Vlan)
9. After going through all the settings the IP phone will restart.

NORTEL IP Phone 1120E/1140E

1. Power cycle the IP phone.
2. Wait until you hear the power on music tone.
3. When you see the Nortel name/label, press the four function keys under the display individually in order from left to right.
4. The login password is 26567*738.
5. Configure the phone attributes as indicated below
   - To navigate, press the right or left sides of the 4 position rocker switch.
   - Press middle button on the rocker switch to edit a setting.
   - To change a value press the top or bottom of the 4 position rocker switch.

[1] In some case, LLDP support may depend on the IP phone firmware version. Please check phone firmware version as well to ensure LLDP capability is supported.

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Enable 802.1x EAP	Not Checked
Enable 802.1ab (LLDP)	Checked
DHCP	Full
Disable Voice 802.1Q	Not Checked
Network Port Speed	Auto
Voice Vlan	LLDP VLAN Name
VLAN Filter	Not Checked
Control Priority Bits	Auto
Media Priority Bits	Auto

6. Leave data port settings at default. (enabled , no data Vlan)
7. After going through all the settings press “Apply and Reset” to restart the phone.

NORTEL IP Phone 2001

1. Power cycle the IP phone.
2. When you see the Nortel Networks name/label, press the four keys under the display individually in order from left to right.
3. Configure the phone attributes as indicated below
   - Press “OK” to go to the next attribute.
   - Press “backspace” to change a setting.

EAP Enable	N
LLDP Enable	Y
DHCP	Y
Speed	Auto
Cfg XAS	N
Voice 802.1Q	Y
VOICE VLAN	Y
VLAN Cfg	Auto
LLDP Med	N
LLDP VLAN	Y
VLANFILTER	N
Ctrl pBits	Auto
Media pBits	Auto
Data VLAN	N
GARP Ignore	N
PSK SRTP	N

4. After going through all the settings the set will restart.

NORTEL IP Phone 2002/2004

2. Power cycle the IP phone.
3. When you see the Nortel Networks name/label, press the four keys under the display individually in order from left to right.
4. Configure the phone attributes as indicated below
   - Press “OK” to go to the next attribute.
   - Press “backspace” to change a setting.

EAP Enable	N
LLDP Enable	Y
DHCP	Y
Cached IP	N
DHCP	Full
Cfg XAS	N
VOICE VLAN	Y

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VLAN Cfg	Auto
LLDP Med	N
LLDP VLAN	Y
VLANFILTER	N
PC Port	Off
DUPLEX	Auto
GARP Ignore	N
PSK SRTP	N

5. After going through all the settings the set will restart.

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List of Acronyms

BES	Nortel Networks Business Ethernet Switch

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